

WHAT IS CLAIMED IS:

1. An electrical power conversion system comprising:  
a load receiver for powering and controlling loads, said load receiver  
5 comprising:

a decoupler for decoupling a communication signal from an electrical  
power bus, said communication signal containing encoded load information,  
wherein the decoupler electrically isolates the communication signal from the  
10 power signal;

a data receiver for receiving the communication signal from the  
decoupler and deriving data therefrom;

a data decoder for decoding data received from the data receiver and  
15 converting it to a converter signal according to the encoded load information;  
and

a power converter for receiving the converter signal from the data  
decoder, wherein the power converter converts an electrical power bus input  
20 of a first voltage into a power output at a second voltage for powering the  
loads.

2. An electrical power conversion system according to claim 1, further  
25 comprising:

a load transmitter for transmitting encoded load information in a  
communication signal onto the electrical power bus, said load transmitter comprising:

a data encoder for encoding load information into data;

30 a data transmitter for receiving the data from the data encoder and  
transmitting a communication signal; and

a coupler for receiving the communication signal from the data  
transmitter and coupling the communication signal onto the electrical power  
35 bus.

3. An electrical power conversion system according to claim 1, wherein:  
the load information contains load state and load address information; and  
further wherein the power converter sets the state of the load according to the  
converter signal when the power converter is powering the load associated with that  
load address.

4. An electrical power conversion system according to claim 2, wherein  
the load information contains load state and load address information; and  
further wherein the power converter sets the state of the load according to the  
converter signal when the power converter is powering the load associated with that  
load address.

5. An electrical power conversion system according to claim 2 further  
comprising:  
a data encoder for encoding return load information from the power converter  
or the load;  
a load return transmitter for transmitting return load data from the data  
encoder;  
a coupler for coupling communication data received from the load return  
transmitter to the electric power bus.

6. An electrical power conversion system according to claim 5, wherein  
the load information contains load state and load address information; and  
further wherein the power converter sets the state of the load according to the  
converter signal when the power converter is powering the load associated with that  
load address.

7. An electrical power conversion system according to claim 1 for  
powering vehicle loads, wherein the first voltage is about thirty-six volts to forty-two  
volts (36V-42V) and the second voltage is about twelve volts to fourteen volts (12V-  
14V).

8. An electrical power conversion system according to claim 2 for powering vehicle loads, wherein the first voltage is about thirty-six volts to forty-two volts (36V-42V) and the second voltage is about twelve volts to fourteen volts (12V-14V).

9. An electrical power conversion system according to claim 3 for powering vehicle loads, wherein the first voltage is about thirty-six volts to forty-two volts (36V-42V) and the second voltage is about twelve volts to fourteen volts (12V-14V).

10. An electrical power conversion system according to claim 4 for powering vehicle loads, wherein the first voltage is about thirty-six volts to forty-two volts (36V-42V) and the second voltage is about twelve volts to fourteen volts (12V-14V).

11. An electrical power conversion system according to claim 5 for powering vehicle loads, wherein the first voltage is about thirty-six volts to forty-two volts (36V-42V) and the second voltage is about twelve volts to fourteen volts (12V-14V).

12. An electrical power conversion system according to claim 6 powering vehicle loads, wherein the first voltage is about thirty-six volts to forty-two volts (36V-42V) and the second voltage is about twelve volts to fourteen volts (12V-14V).

13. An electrical power conversion system for powering vehicle loads, comprising:

a load transmitter for transmitting encoded load information in a communication signal onto a vehicle electrical power bus operating at about thirty-six volts to forty-two volts (36V-42V) DC, said load transmitter comprising:

a data encoder for encoding load state and load address information into encoded data;

a frequency shift keying transmitter for receiving the encoded data from the data encoder and transmitting the encoded data as an FSK communication signal; and

a coupler for coupling the FSK communication signal onto the vehicle electrical power bus;

and

a load receiver for controlling vehicle loads and providing said vehicle loads with electrical power at about twelve volts to fourteen volts (12V-14V), said load receiver comprising:

a decoupler for decoupling the FSK communication signal from an electrical power bus, said FSK communication signal containing encoded load state and load address information, wherein the decoupler electrically isolates the communication signal from the power signal;

a frequency shift keying receiver for receiving the FSK communication signal from the decoupler and deriving encoded data from the FSK communication signal;

a data decoder for decoding the encoded data received from the frequency shift keying receiver and converting it into a converter signal according to the decoded load state and load address information; and

a power converter for converting the vehicle electrical bus power signal of about thirty-six volts to forty-two volts (36V-42V) DC into a load power output equivalent to about twelve volts to fourteen volts (12V-14V) for powering vehicle electrical loads, wherein the power converter sets the state of a load in accordance with the converter signal when the power converter is powering a load associated with that load address.

14. An electrical power conversion system for a vehicle electrical system according to claim 13, wherein the power converter contains a DC-to-DC converter.

15. An electrical power conversion system for a vehicle electrical system according to claim 13, wherein the power converter contains a DC-to-AC inverter.

16. An electrical power conversion system for powering vehicle loads, comprising:

a load transmitter for transmitting encoded load information in a communication signal onto a vehicle electrical power bus operating at about thirty-six volts to forty-two volts (36V-42V) DC, said load transmitter comprising:

a data encoder for encoding load state information and load address information into encoded data;

a frequency shift keying transmitter for receiving the encoded data from the data encoder and transmitting the encoded data as an FSK communication signal onto a vehicle communication bus;

and

a load receiver for controlling vehicle loads and providing said vehicle loads with electrical power at about twelve volts to fourteen volts (12V-14V), said load receiver comprising:

a frequency shift keying receiver for receiving the communication signal from the vehicle communication bus and deriving encoded data from the FSK communication signal;

a data decoder for decoding the encoded data received from the frequency shift keying receiver and converting it into a converter signal according to the decoded load state and load address information; and

a power converter for converting the vehicle electrical bus power signal of about thirty-six volts to forty-two volts (36V-42V) DC into a load power output equivalent to about twelve volts to fourteen volts (12V-14V) for powering vehicle electrical loads, wherein the power converter sets the state of a load in accordance with the converter signal when the power converter is powering a load associated with that load address.

17. An electrical power conversion system for a vehicle electrical system according to claim 16, wherein the power converter contains a DC-to-DC converter.

18. An electrical power conversion system for a vehicle electrical system according to claim 16, wherein the power converter contains a DC-to-AC inverter.